National Geodetic Survey

OPUS:

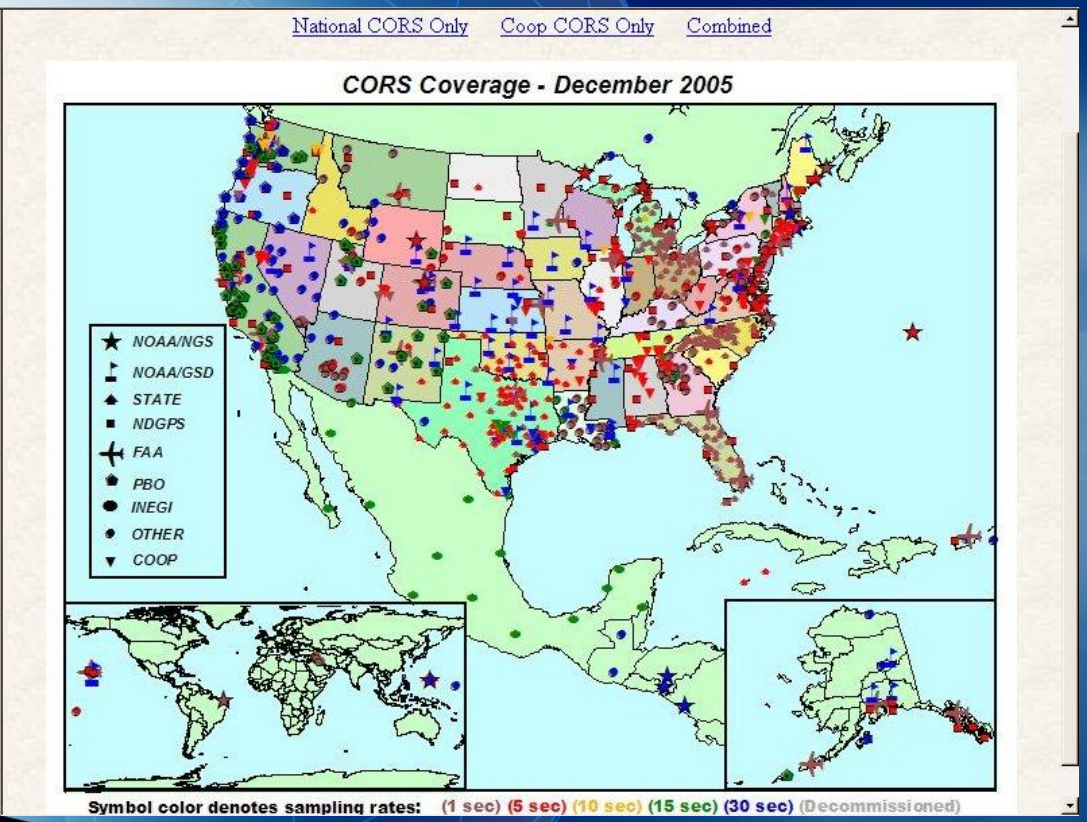
Online Positioning User Service

http://www.ngs.noaa.gov/OPUS/
ngs.opus@noaa.gov

National Oceanic and Atmospheric Administration

WHAT IS OPUS?

National Geodetic Survey



- **O**n-line **P**ositioning **U**ser **S**ervice

- Fast & easy access to the NSRS (**National Spatial Reference System**) for GPS users

National Oceanic and Atmospheric Administration

OPUS HomePage - Microsoft Internet Explorer provided by National Geodetic Survey

Address http://www.ngs.noaa.gov/OPUS/ Go File Edit View Favorites

Address http://www.ngs.noaa.gov/OPUS/

OPUS Upload | What is OPUS | Using OPUS | Recent Solutions | Faqs | OPUS Policies | Contact OPUS

What is OPUS

Using OPUS

Recent Solutions

FAQs

OPUS Policies

Contact OPUS

Recent Developments

[Nov 10, 2004] Format of the OPUS data sheet is changed to provide space for the

1.

Ente

2.

Ente

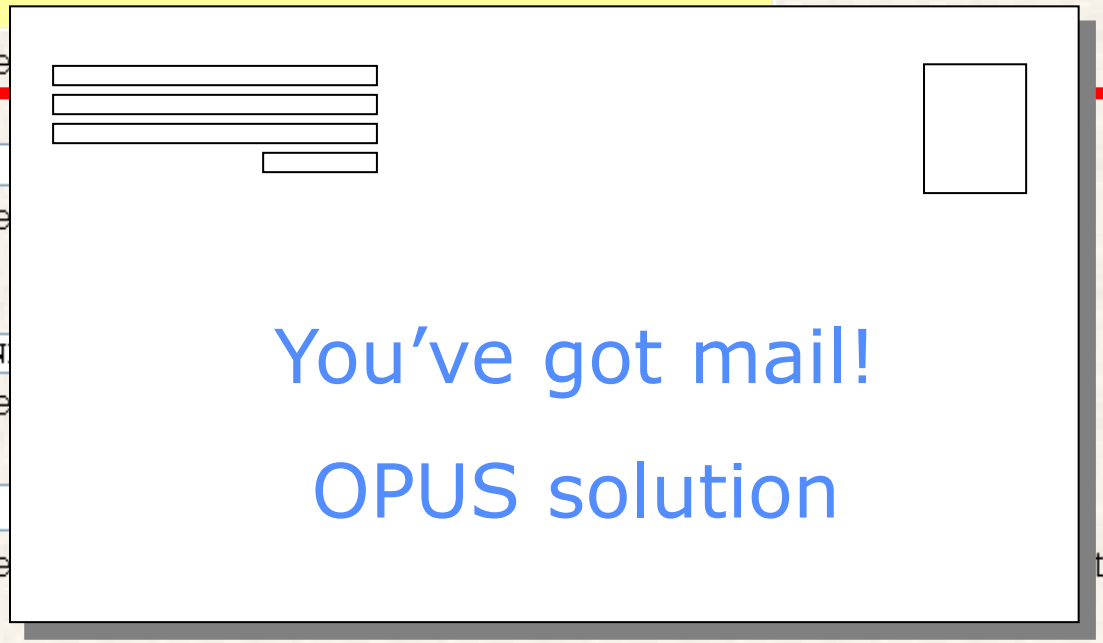
3. NON

Sele

4. 0.0

Ente

the basic OPUS



Upload File

Your data must be dual frequency data (L1 and L2) and a minimum of 2 hours of observations is recommended.
Your collection rate must be 1,2,3,5,10,15 or 30 seconds.

OPUS solution : doro128o.03o 000384055 - Mozilla Thunderbird

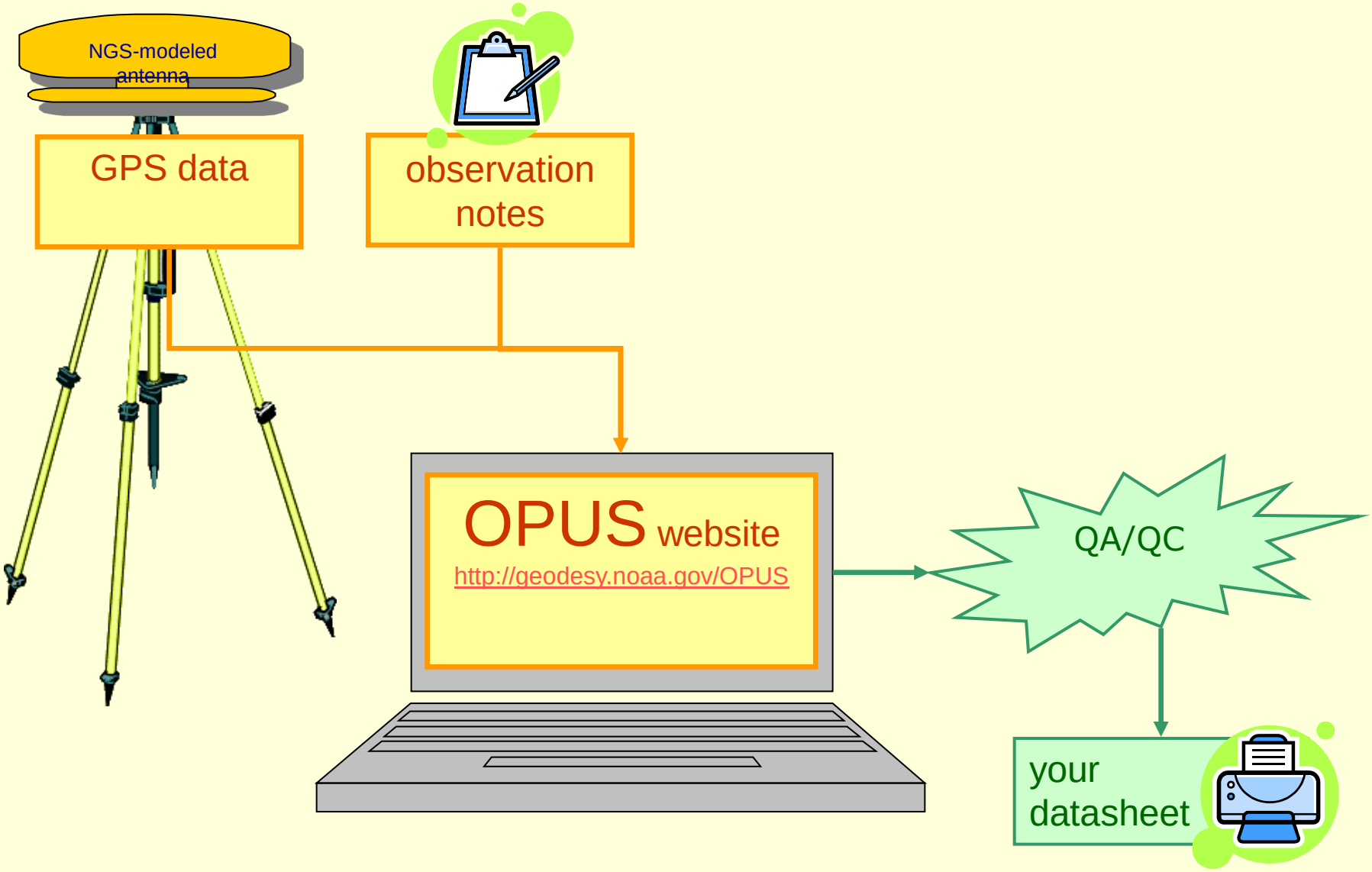
File Edit View Go Message Tools Help

Get Mail | Write | Address Book | Reply | Reply All | Forward | Delete | Junk | Print | Stop

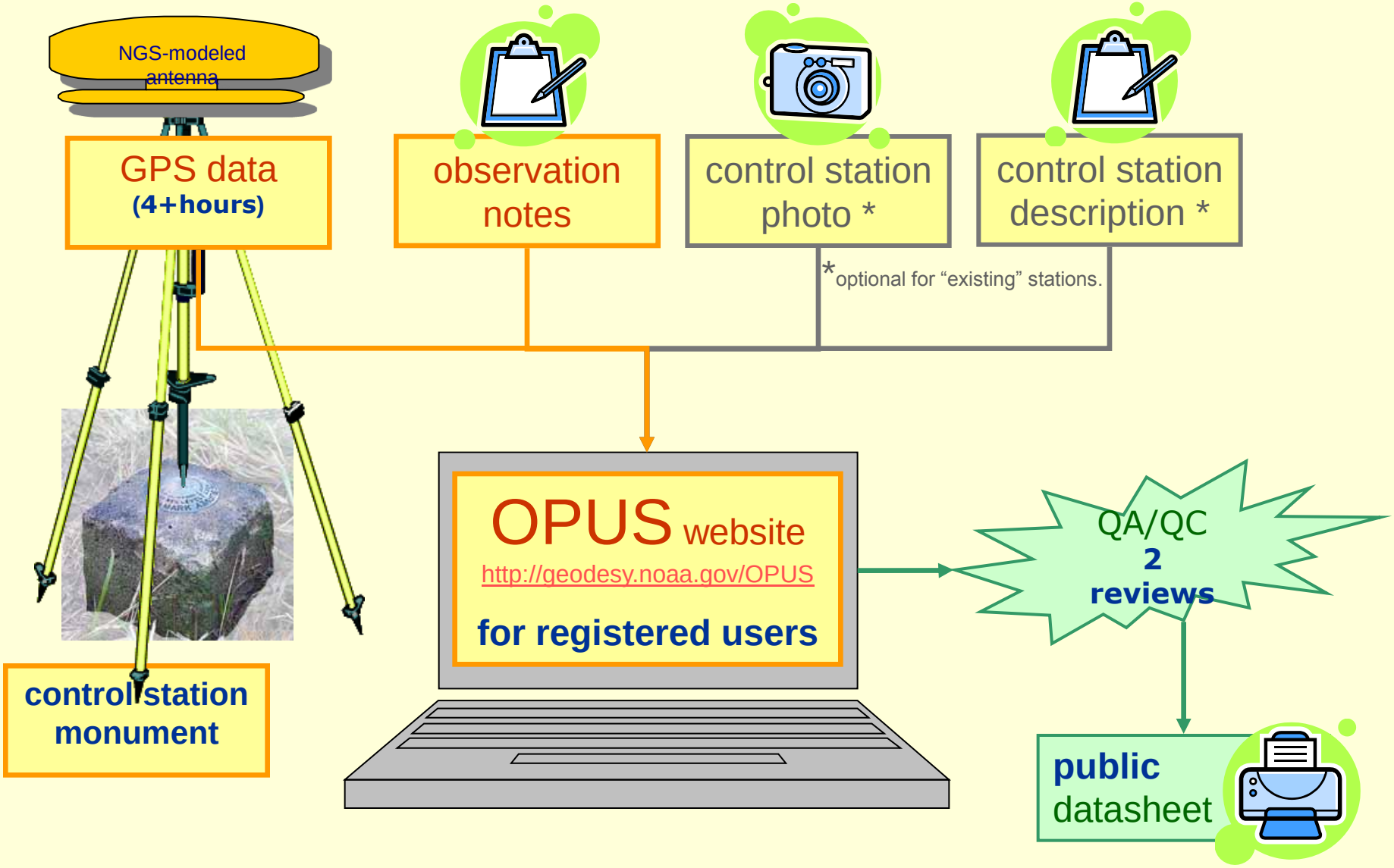
Subject: OPUS solution : doro128o.03o 000384055
From: opus@ngs.noaa.gov
Date: 2:28 PM
To: joe.evjen@noaa.gov

```
 FILE: doro128o.03o 000384055

                            NGS OPUS SOLUTION REPORT
                            ========================

      USER: joe.evjen@noaa.gov                    DATE: October 20, 2005
RINEX FILE: doro128o.03o                          TIME: 18:28:23 UTC


  SOFTWARE: page5  0411.19 master30.pl            START: 2003/05/08  14:29:00
 EPHEMERIS: igs12174.eph [precise]                 STOP: 2003/05/08  20:22:00
  NAV FILE: brdc1280.03n                      OBS USED: 12128 / 12305    :  99%
  ANT NAME: ASH701975.01A+GP                # FIXED AMB:    57 /    59    :  97%
ARP HEIGHT: 2.0                             OVERALL RMS: 0.018(m)


 REF FRAME: NAD_83(CORS96)(EPOCH:2002.0000)          ITRF00 (EPOCH:2003.3500)

         X:       592840.506(m)    0.004(m)          592839.863(m)    0.004(m)
         Y:     -4856853.798(m)    0.006(m)        -4856852.383(m)    0.006(m)
         Z:      4078078.293(m)    0.007(m)         4078078.180(m)    0.007(m)

       LAT:   39 59 58.25431       0.004(m)       39 59 58.28240       0.004(m)
     E LON:  276 57 33.29650       0.004(m)      276 57 33.27682       0.004(m)
     W LON:   83  2 26.70350       0.004(m)       83  2 26.72318       0.004(m)
    EL HGT:          208.417(m)    0.008(m)              207.209(m)    0.008(m)
 ORTHO HGT:          242.150(m)    0.026(m) [Geoid03 NAVD88]
```

OPUS Concept



OPUS → Datasheet Concept



control station requirements

Stable
Permanent
Unique
Recoverable
Safe

control station monument

GPS data requirements

“OPUSable”

4+ hours of dual frequency data

NGS-calibrated antenna

OPUS must achieve:

- ≥ 90% observations used
- ≥ 80% ambiguities fixed
- ≤ 0.02m peak-to-peak horizontal
- ≤ 0.04m peak-to-peak vertical

metadata requirements

*optional for “existing” stations.

Simplified bluebooking

Mark Recovery

Rinex File Name: **doro128o.03o**

Enter the mark's PID: DG7181 | What's a PID ? | Find PID | no PID ? |

OPTIONAL

The mark was found in *Explain.*
- (•) Good condition.
- ( ) Poor, disturbed, mutilated, requires maintenance.

OPTIONAL comments *Explain.*

```
RECOVERED AS DESCRIBED WITH THE FOLLOWING CHANGES
-- NO CHANGES.
```

Your initials JGE

OPTIONAL photos: *Explain.*

1. C:\DOROTA_1.jpg Browse... - CLOSE-UP
2. C:\DOROTA_3.jpg Browse... Select photo type
3. Browse...

Select photo type
- CLOSE-UP
- MONUMENT
- HORIZON
- EQUIPMENT
- map or form
- other

Submit To Database **Return to OPUS M**

Privacy Policy

- The data you provide are reviewed by NGS personnel, are recorded in our database, and are displayed on datasheets.
- Providing this information is voluntary. See also our NOAA Privacy Policy.

Mark Description

Rinex File Name: doro128o.03o

REQUIRED

Designation: challstrom reset 2005 **Stamping:** challstrom 1995 2005

Type: D = Disk | DH = Horizontal control disk

IF Type ="Rod" : Rod Depth Sleeve Depth ft m

Setting: 7 = Set in top of concrete monument

specific setting: 8" square concrete monument, 9' deep

Descriptive Comments: The station is located in the southeast quadrant of the intersection of main street and union road, 12' south from centerline of main street, 12' east from cent

(describe the st

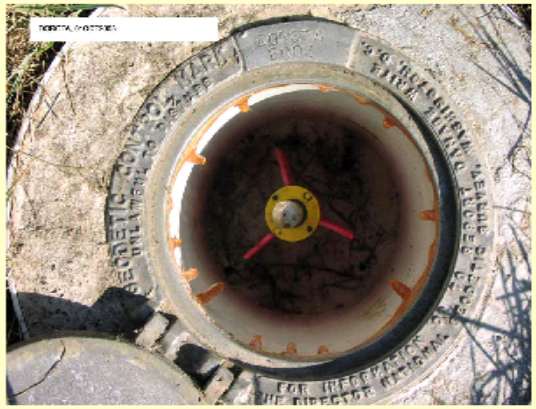
Photo 1: C:\DOROTA_1

http://ngsweb.ngs.noaa.gov/cgi-bin/opus_db_load.prl?DUMP=/home/disk3/Opus/OPUS

Mail AIM Home Radio Netscape Search Bookmarks Instant Message WebMail

OPUS_DB_LOAD_DUMP

FILE = /home/disk3/Opus/OPUS-DB/000383951/C:\foote\DOROTA_1.jpg



OPTIONAL

Photo 2: C:\DOROTA_3

Photo 3:

Stability: D = Monumen

Magnetic: N = No magne

Application: --- no special u

Antenna S/N: 3333333

Receiver S/N: 4444444

Observer Remarks: nothing inte

http://ngsweb.ngs.noa

Mail AIM Home Radio Netscape

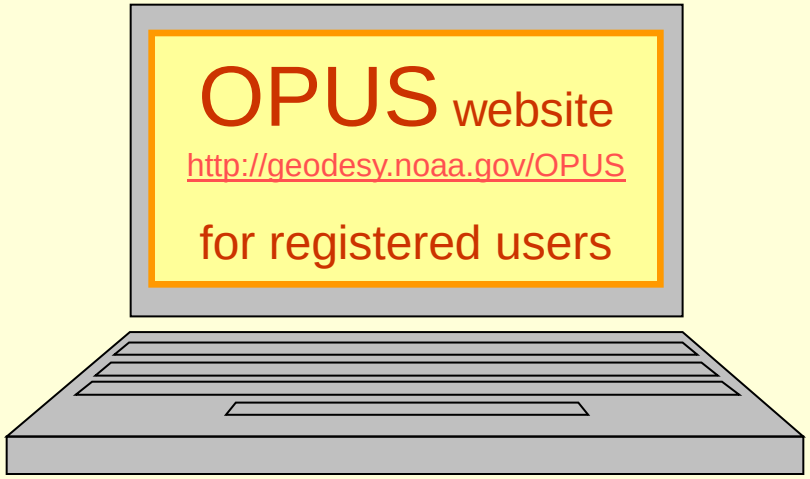
OPUS_DB_LOAD_DUMP

FILE = /home/disk3/Opus/OPUS-DB/000383951/C:\foote\DOROTA

OPUS registry

Registration stores the following:

- Name
- Address
- Agency
- Experience- GPS & OPUS




OPUS HomePage - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://www.ngs.noaa.gov/OPUS/OPUS_03.html
Go
Online Positioning User Service
OPUS Upload | What is OPUS | Using OPUS | Faqs | OPUS Policies | Contact OPUS | OPUS News | Register
What is OPUS
Using OPUS
FAQs
OPUS Policies
Contact OPUS
OPUS News!
Register To Publish OPUS Results
1.
Enter your email address
2.
Browse...
Enter your DATA file
Now accepting RINEX and selected receiver formats.
Data files may also be compressed (.ZIP, .zip, .Z, .gz)
3. NONE no antenna selected - see FAQ #6
Select the antenna type
4. 0.0 meters
Enter the antenna height
5. Options
If desired, select from several options to modify the basic OPUS procedures.
Upload File
Your data must be dual frequency data (L1 and L2) and a minimum of 2 hours of observations is recommended.
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New Registrants

All OPUS submissions to the NGS Integrated Data Base must be reviewed by a registered reviewer. These registered reviewers will complete this form and select their User Name and Password which is needed in order to elect the OPUS Option "Submit to Data Base". Prior to publication in the Data Base, OPUS submissions for that User Name and Password will be emailed to the registered reviewer uniquely identified by that User Name and Password. The reviewer will notify NGS by reply email that 1) all the information is correct and NGS may proceed to publication or 2) corrections are required prior to publication, or 3) withdraw the submission.

To start the registration process, NGS needs to know who will be reviewing the OPUS submissions to the Data Base. Please complete the information below and note that the email address that you enter here is the address to which your OPUS submissions will be sent for review. The information provided here will be kept strictly confidential.

First Name: joe *
Last Name: evjen *
Title: geodesist *
Company/Agency: NGS , Or: *
Address 1: 1315 east-west highway *
Address 2: ssmc3 station 8854
City: Silver Spring *
State: Maryland * Zip: 20910 *
Phone: 301.713.3194 *
Email: joe.evjen@noaa.gov *

Please enter a User Name and Password for your submissions to the NGS Data Base. You may share this User Name and Password as you wish, however all submissions via OPUS to the Data Base using your User Name and Password will be sent to you at the above email address for review and verification.

Enter Your User Name: joejoe *
Enter Your Password: junkjunk *
Re-Enter Your Password: junkjunk *

NGS would like to know about your professional qualifications and/or your experience with GPS positioning. This information should convey to us that you understand the relevant elements of precise GPS and geodetic positioning. Registrants should be thoroughly familiar with the content of Using OPUS, PAT22 Report, GPS Manual. Please answer below as appropriate. All responses will be kept strictly confidential.

Describe your professional qualifications (For example, Are you a License Surveyor; What GPS equipment have you used; Year experience with GPS; Previous experience with OPUS; Projects submitted to NGS using "Blue Book"; etc ..):

quality control

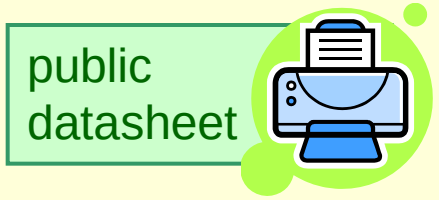
```
$ ../verify doro128o.03o.txt


EPHEMERIS:       OK
OBS USED:        OK   98.5615603413247 %
DURATION:        OK
ANTENNA:         ASH701975.01A
FIXED AMB:       OK   94.9152542372881 %
ARP HGT:         OK   2.0 (m)
RMS:             OK   0.019 (m)
LAT RANGE:       OK   0.001 (m)
LON RANGE:       OK   0.005 (m)
HGT RANGE:       OK   0.013 (m)
SEQ:             OK   000383951          000383951
PID:             OK   DG7181   DG7181
```

1) I have reviewed the information above as well as the datasheet and photos submitted for this file and verify that this information is correct. Please proceed with this publication.
   Name: Gerry Mader
2) This contribution is withdrawn. Do not publish at this time.
   Name:

OPUS datasheet

Identical to normal datasheet
PLUS agency attribution
PLUS links to OPUS reports & statistics



```
KO0203                                *CURRENT SURVEY CONTROL
KO0203
KO0203* NAD 83(1986)-   39 10 52.         (N)       112 42 07.          (W)       SCALED
KO0203* NAVD 88        -       1407.788    (meters)       4618.72        (feet)   ADJUSTED
KO0203
```

```
        LAT:   39 10 52.70828           0.006(m)
      E LON:  247 17 52.19600           0.027(m)
      W LON:  112 42  7.80400           0.027(m)
     EL HGT:           1387.827(m)      0.056(m)
  ORTHO HGT:           1407.770(m)      0.062(m)
```

```
K00203
K00203* NAD 83(CORS)-  39 10 52.70828(N)     112 42 07.80400(W)      OPUS
K00203* NAVD 88        -      1407.788   (meters)      4618.72     (feet)  ADJUSTED
K00203
```

Bench mark elevation retained

Position accuracy improved 95 feet!

One more tie between GRS80-NAVD88.

```
K00203'RECOVERED AS DESCRIBED

*** retrieval complete.
Elapsed Time = 00:00:00
```

OPUS-DB benefits

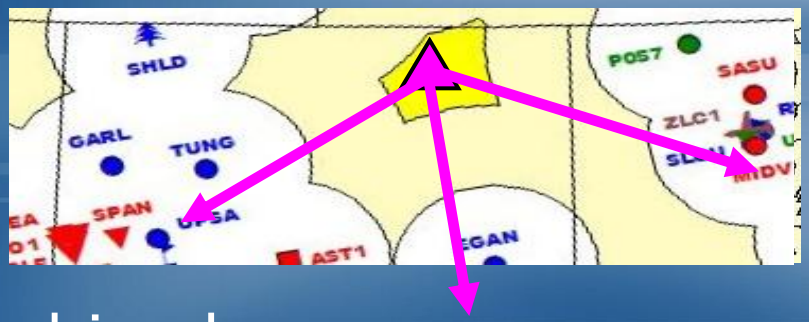
National Geodetic Survey

- Data submittal
  - Faster
  - cheaper
- Consistent data processing
- Improve maintenance of NSRS
  - Add GPS on bench marks
  - Archive PLSS corners?

OPUS-DB limitations

National Geodetic Survey

- GPS data only
- PAGES software only
- No direct tie to adjacent monuments
- No redundancy
- Reduced oversight
- Idiot-proofing?
- Field logs are not archived



OPUS-DB data quality

National Geodetic Survey

- Registered, trained users
- 4+ hours of static GPS
- OPUS error checking
- NGS reviews each submittal
- Datasheet includes:
  - "Caveat emptor" warning
  - Datasheet includes DQA statistics
  - Agency attribution
- Coordinates: first, best, average

Many Flavors of OPUS Planned

National Geodetic Survey

- OPUS
  - » $$$ receiver, hours of data
- OPUS-DB
  - » $$$ receiver, hours of data, share results
- OPUS Projects
  - » Multiple $$$ receivers, share results
- OPUS Rapid Static
  - » $$$ receiver, minutes of data
- OPUS GIS
  - » ¢¢ receiver, minutes of data